AccessPro PC Cards

This chapter provides information on the AccessPro PC card. The information is organized into the following sections:

- Product Overview
- Standard Features
- Software Options
- Model AP-EC
- Model AP-RC
- Model AP-EBC
- Model AP-RBC
- Options

Note Documentation for the AccessPro PC card is available in two forms: on a CD-ROM called Cisco Connection Documentation, Enterprise Series (formerly called UniverCD) and printed books. You can request a free copy of the documentation CD when you place an order and have the option of subscribing to a CD update service. Installation documentation ships with each chassis, and a configuration note ships with each component ordered. All configuration notes are available on the CD.

You can also access Cisco technical documentation on the World Wide Web URL http://www.cisco.com. For more information, see the chapter "Documentation" at the end of the catalog.

Product Overview

The AccessPro PC card is a full-featured multiprotocol router card that can be installed in an IBM or compatible PC equipped with either an ISA bus or EISA bus.

This series of PC-compatible router cards is based on Cisco 2500 series technology. The cards provide scalable wide-area connectivity and flexible full-function multiprotocol routing support. An AccessPro PC card runs autonomously using only its own processing power, expanding the capabilities of a PC server without impacting any existing applications.

Cisco Configuration Builder, an application that is available as an option, can be used to simplify configuration. The application runs in both Microsoft Windows NT and Windows environments.

The AccessPro PC cards also include built-in PC serial port emulation so that you can configure an AccessPro PC card from a PC, in lieu of the serial console port found on Cisco 2500 series products. You can select from four communications ports: COM1, COM2, COM3, or COM4. Access to the console port interface is available through the ISA bus using terminal emulation software (not provided) running on a PC.

There are currently four models of the AccessPro PC card:

- Model AP-EC—one Ethernet port and one synchronous serial port
- Model AP-RC—one Token Ring port and one synchronous serial port
- Model AP-EBC—one BRI port, two synchronous serial ports, and one Ethernet port
- Model AP-RBC—one BRI port, two synchronous serial ports, and one Token Ring port

Table 218 AccessPro PC Card Summary of Features

Characteristic	Features
Network interfaces	1 Ethernet or 1 Token Ring 1 synchronous serial (1E1T)
Ethernet interface	IEEE 802.3 10BaseT (RJ-45)
Token Ring interface	IEEE 802.5 10BaseT (RJ-45), supports unshielded twisted-pair wiring[1]
Synchronous serial interfaces	EIA/TIA-232, EIA/TIA-449, V.35, X.21 (NRZ/NRZI[2] and DTE/DCE) EIA-530 (NRZ/NRZI and DTE) All serial cables use a DB-60 chassis connector
Auxiliary port	Asynchronous serial (RJ-45, EIA/TIA-232-compatible)
PC serial port emulation	COM1, COM2, COM3, and COM4 (selectable)
Memory	4-MB Flash memory (expandable to 16 MB) 32-KB NVRAM Primary memory (DRAM SIMMs) varies with software ordered (expandable to 16 MB)
Processor type	20-MHz Motorola 68EC030
Software	Choice of feature sets: Cisco IOS Release 11.1 feature sets (see Table 220) Cisco IOS Release 11.0 feature sets (see Table 221) Cisco IOS Release 10.3 feature sets (see Table 222) Cisco IOS Release 10.2 feature sets (see Table 223) Cisco IOS Release 10.0 feature sets (see Table 224)
Dimensions (H x L)	4.8 x 13.3" (12.2 x 33.8 cm)

1. European regulations require STP Category 3 (screen cable) wiring.
2. NRZ/NRZI = nonreturn to zero/nonreturn to zero inverted.

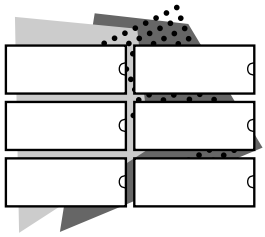
Table 219 AccessPro PC Card Environmental Specifications

Description	Specification
Power requirements	3.0A @ 5V, 0.5A @ 12V 30W maximum
Operating temperature range	32 to 104 F (0 to 40 C)
Nonoperating temperature	–40 to 185 F (–40 to 85 C)
Humidity (noncondensing)	5 to 95%

Standard Features

The AccessPro PC card includes the following features:

- One Token Ring or Ethernet port, RJ-45. Note that European regulations for Token Ring require the use of STP Category 3 wiring (screen cable).
- One synchronous serial port (DTE or DCE), up to 4 Mbps. Check with your local sales office for approved speeds based on local country regulation compliance.
- One asynchronous port, up to 38.4 kbps.
- 4-MB Flash EPROM for software upgrades. Depending on the Cisco IOS release and feature set, your AccessPro PC card might require more memory. Refer to Table 228 and Table 229, later in this chapter, for the minimum memory requirements for each feature set.
- DRAM varies with the software ordered. Refer to Table 228 and Table 229, later in this chapter, for the minimum memory requirements for each feature set.
- Auxiliary port cable with RJ-45 to DB-25 DCE and DTE connectors.
- Choice of feature sets, which can be upgraded.



Software Options

The AccessPro PC card supports the following software releases:

- Cisco IOS Release 11.1 feature sets: Table 220
- Cisco IOS Release 11.0 feature sets: Table 221
- Cisco IOS Release 10.3 feature sets: Table 222
- Cisco IOS Release 10.2 feature sets (choice of seven): Table 223
- Cisco IOS Release 10.0 feature sets: Table 224

Table 220 Cisco IOS Release 11.1 Feature Sets—AccessPro PC Card

Category	IP Routing	IP/IPX Routing	Desktop	Enterprise
LAN support	IP, transparent and translational bridging[1], concurrent routing and bridging, multiring, LAN extension host, GRE	IP, transparent and translational bridging[1], concurrent routing and bridging, multiring, LAN extension host, GRE, Novell IPX	IP, transparent and translational bridging[1], concurrent routing and bridging, multiring, LAN extension host, GRE, Novell IPX, AppleTalk 1 and 2, DECnet IV	IP, transparent and translational bridging[1], concurrent routing and bridging, multiring, LAN extension host, GRE, Novell IPX, AppleTalk 1 and 2, DECnet IV, DECnet V, OSI, XNS, Banyan VINES, Apollo Domain
WAN services	HDLC, PPP[2], X.25[3], Frame Relay, ISDN[4], SMDS, Switched 56	HDLC, PPP[2], X.25[3], Frame Relay, ISDN[4], SMDS, Switched 56, IPXWAN 2.0	HDLC, PPP[2], X.25[3],Frame Relay, ISDN[4], SMDS, Switched 56, IPXWAN 2.0	HDLC, PPP[2], X.25[3], Frame Relay, ISDN[4], SMDS, Switched 56, IPXWAN 2.0
WAN optimization	Header, link, and payload compression[5]; dial-on-demand; dial backup; bandwidth-on-demand; custom and priority queuing; weighted fair queuing; snapshot routing	Header[6], link, and payload compression[5]; dial-on-demand; dial backup; bandwidth-on-demand; custom and priority queuing; weighted fair queuing; snapshot routing	Header[6], link, and payload compression[5]; dial-on-demand; dial backup; bandwidth-on-demand; custom and priority queuing; weighted fair queuing; snapshot routing	Header[6], link and payload compression[5]; dial-on-demand; dial backup; bandwidth-on-demand; custom and priority queuing; weighted fair queuing; snapshot routing
IP routing	RIP, RIP Version 2, IGRP, Enhanced IGRP, OSPF, BGP, EGP, PIM, NHRP, policy-based routing	RIP, RIP Version 2, IGRP, Enhanced IGRP, OSPF, BGP, EGP, PIM, NHRP, policy-based routing	RIP, RIP Version 2, IGRP, Enhanced IGRP, OSPF, BGP, EGP, PIM, NHRP, policy-based routing	RIP, RIP Version 2, IGRP, Enhanced IGRP, OSPF, BGP, EGP, PIM, NHRP, policy-based routing, ES-IS, IS-IS
Other routing	–	IPX RIP, NLSP	IPX RIP, NLSP, RTMP, AURP, SMRP	IPX RIP, NLSP, RTMP, AURP, SMRP, SRTP
IBM support	Optional[7]: SRB/RSRB, SRT, DLSW+, SNA and NetBIOS WAN optimization via local acknowledgment, caching and filtering, SDLC integration, SDLC-to-LAN conversion (SDLLC), SDLC transport (STUN), Frame Relay SNA Support (RFC 1490), NetView Native Service Point, QLLC, Bisync, BAN for SNA Frame Relay support	Optional[7]: SRB/RSRB, SRT, DLSW+, SNA and NetBIOS WAN optimization via local acknowledgment, caching and filtering, SDLC integration, SDLC-to-LAN conversion (SDLLC), SDLC transport (STUN), Frame Relay SNA Support (RFC 1490), NetView Native Service Point, QLLC, Bisync, BAN for SNA Frame Relay support Optional[8]: APPN	Optional[7]: SRB/RSRB, SRT, DLSW+, SNA and NetBIOS WAN optimization via local acknowledgment, caching and filtering, SDLC integration, SDLC-to-LAN conversion (SDLLC), SDLC transport (STUN), Frame Relay SNA Support (RFC 1490), NetView Native Service Point, QLLC, Bisync, BAN for SNA Frame Relay support	Included: SRB/RSRB, SRT, DLSW+, SNA and NetBIOS WAN optimization via local acknowledgment, caching and filtering, SDLC integration, SDLC-to-LAN conversion (SDLLC), SDLC transport (STUN), Frame Relay SNA Support (RFC 1490), NetView Native Service Point, QLLC, Bisync, BAN for SNA Frame Relay support, TG/COS, Downstream PU Concentration (DSPU) Optional[8]: APPN
Management	AutoInstall, SNMP, RMON events and alarms[9], Telnet, automatic modem configuration[10]	AutoInstall, SNMP, RMON events and alarms[9], Telnet, automatic modem configuration[10]	AutoInstall, SNMP, RMON events and alarms[9], Telnet, automatic modem configuration[10]	AutoInstall, SNMP, RMON events and alarms[9], Telnet, automatic modem configuration

Category	IP Routing	IP/IPX Routing	Desktop	Enterprise
Security	Access lists, extended access lists, access security, TACACS+, RADIUS, MD5 routing authentication, Lock and Key	Access lists, extended access lists, access security, TACACS+, RADIUS, MD5 routing authentication, Lock and Key	Access lists, extended access lists, access security, TACACS+, RADIUS, MD5 routing authentication, Lock and Key	Access lists, extended access lists, access security, TACACS+, RADIUS, MD5 routing authentication, Lock and Key, Kerberized login
Protocol translation	–	–	–	Telnet, LAT, rlogin, TN3270, X.25, PPP
Remote node[11]	SLIP, PPP, CSLIP, CPPP, DHCP, IP pooling, async master interfaces, NetBEUI over PPP	SLIP, PPP, CSLIP, CPPP, DHCP, IP pooling, async master interfaces, IPXCP[6], NASI[12], NetBEUI over PPP	SLIP, PPP, CSLIP, CPPP, DHCP, IP pooling, async master interfaces, ARAP 1.0/2.0, IPXCP[6], NASI[12], NetBEUI over PPP, MacIP, ATCP	SLIP, PPP, CSLIP, CPPP, DHCP, IP pooling, async master interfaces, IPX and ARAP on virtual async interfaces, ARA P1.0/2.0, IPXCP[6], NASI[12], NetBEUI over PPP, MacIP, ATCP
Terminal services[11]	Telnet, rlogin, X.25 PAD	Telnet, rlogin, X.25 PAD	Telnet, rlogin, X.25 PAD	Telnet, rlogin, X.25 PAD, Xremote, LAT[13], TN3270
Product numbers	See Table 225.	See Table 225.	See Table 225.	See Table 225.

1. See the category “IBM Support” for information about source-route bridging (SRB).
2. PPP includes support for LAN protocols supported by the feature set, address negotiation, PAP and CHAP authentication, PPP compression, and multilink PPP.
3. Includes X.25 switching.
4. ISDN support includes calling line identification (ANI), X.25 over the B channel, ISDN subaddressing, and applicable WAN optimization features.
5. X.25 and Frame Relay payload compression.
6. IPX header compression (RFC 1553) is available in Cisco IOS Release 11.1(1) and later releases.
7. “Optional” means a separate Cisco IOS feature set with the IBM base option: IP/IBM base, IP/IPX/IBM base, Desktop/IBM base.
8. “Optional” means separate Cisco IOS feature sets: IP/IPX/IBM base/APPN and Enterprise/APPN.
9. The RMON events and alarms groups are supported on all interfaces.
10. Automatic modem configuration is available for all feature sets in Cisco IOS Release 11.1(2) and later releases. For the Enterprise feature set, automatic modem configuration is available in Cisco IOS Release 11.1(1) and later releases.
11. Limited support on router auxiliary ports.
12. NASI is available in Cisco IOS Release 11.1(2) and later releases.
13. Use of LAT requires terminal license (FS-L8-10.X= for an 8-user license or FS-L16-10.X= for a 16-user license).

Table 221 Cisco IOS Release 11.0 Feature Sets—AccessPro PC Card

Category	IP Routing	IP/IPX Routing	Desktop	Enterprise
LAN support	IP, transparent and translational bridging[1], concurrent routing and bridging, multiring, LAN extension host, GRE	IP, transparent and translational bridging[1], concurrent routing and bridging, multiring, LAN extension host, GRE, Novell IPX	IP, transparent and translational bridging[1], concurrent routing and bridging, multiring, LAN extension host, GRE, Novell IPX, AppleTalk 1 and 2, DECnet IV	IP, transparent and translational bridging[1], concurrent routing and bridging, multiring, LAN extension host, GRE, Novell IPX, AppleTalk 1 and 2, DECnet IV, DECnet V, OSI, XNS, Banyan VINES, Apollo Domain
WAN services	HDLC, PPP[2], X.25[3], Frame Relay, ISDN[4], SMDS, Switched 56	HDLC, PPP[2], X.25[3], Frame Relay, ISDN[4], SMDS, Switched 56, IPXWAN 2.0	HDLC, PPP[2], X.25[3],Frame Relay, ISDN[4], SMDS, Switched 56, IPXWAN 2.0	HDLC, PPP[2], X.25[3], Frame Relay, ISDN[4], SMDS, Switched 56, IPXWAN 2.0

Category	IP Routing	IP/IPX Routing	Desktop	Enterprise
WAN optimization	Header, link, and payload compression[5]; dial-on-demand; dial backup; bandwidth-on-demand; custom and priority queuing; weighted fair queuing; snapshot routing	Header, link, and payload compression[5]; dial-on-demand; dial backup; bandwidth-on-demand; custom and priority queuing; weighted fair queuing; snapshot routing	Header, link, and payload compression[5]; dial-on-demand; dial backup; bandwidth-on-demand; custom and priority queuing; weighted fair queuing; snapshot routing	Header, link, and payload compression[5]; dial-on-demand; dial backup; bandwidth-on-demand; custom and priority queuing; weighted fair queuing; snapshot routing
IP routing	RIP, IGRP, Enhanced IGRP, OSPF, BGP, EGP, PIM, NHRP, policy-based routing	RIP, IGRP, Enhanced IGRP, OSPF, BGP, EGP, PIM, NHRP, policy-based routing	RIP, IGRP, Enhanced IGRP, OSPF, BGP, EGP, PIM, NHRP, policy-based routing	RIP, IGRP, Enhanced IGRP, OSPF, BGP, EGP, PIM, NHRP, policy-based routing, ES-IS, IS-IS
Other routing	–	IPX RIP, NLSP	IPX RIP, NLSP, RTMP, AURP, SMRP	IPX RIP, NLSP, RTMP, AURP, SMRP, SRTP
IBM support	Optional[6]: SRB/RSRB, SRT, DLSw+, SNA and NetBIOS WAN optimization via local acknowledgment, caching and filtering, SDLC integration, SDLC-to-LAN conversion (SDLLC), SDLC transport (STUN), Frame Relay SNA Support (RFC 1490), NetView Native Service Point, QLLC[7], Bisync[7]	Optional[6]: SRB/RSRB, SRT, DLSw+, SNA and NetBIOS WAN optimization via local acknowledgment, caching and filtering, SDLC integration, SDLC-to-LAN conversion (SDLLC), SDLC transport (STUN), Frame Relay SNA Support (RFC 1490), NetView Native Service Point, QLLC[8], Bisync[8]	Optional[6]: SRB/RSRB, SRT, DLSw+, SNA and NetBIOS WAN optimization via local acknowledgment, caching and filtering, SDLC integration, SDLC-to-LAN conversion (SDLLC), SDLC transport (STUN), Frame Relay SNA Support (RFC 1490), NetView Native Service Point, QLLC[8], Bisync[8]	Included: SRB/RSRB, SRT, DLSw+, SNA and NetBIOS WAN optimization via local acknowledgment, caching and filtering, SDLC integration, SDLC-to-LAN conversion (SDLLC), SDLC transport (STUN), Frame Relay SNA Support (RFC 1490), NetView Native Service Point, QLLC, Bisync, TG/COS, Downstream PU Concentration (DSPU)
Management	AutoInstall, SNMP, Telnet	AutoInstall, SNMP, Telnet	AutoInstall, SNMP, Telnet	AutoInstall, SNMP, Telnet
Security	Access lists, extended access lists, access security, TACACS+, MD5 routing authentication	Access lists, extended access lists, access security, TACACS+, MD5 routing authentication	Access lists, extended access lists, access security, TACACS+, MD5 routing authentication	Access lists, extended access lists, access security, TACACS+, MD5 routing authentication
Protocol translation	–	–	–	Telnet, LAT, rlogin, TN3270, X.25, PPP
Remote node[9]	SLIP, PPP, CSLIP, CPPP, DHCP, IP pooling, async master interfaces	SLIP, PPP, CSLIP, CPPP, DHCP, IP pooling, async master interfaces, IPXCP	SLIP, PPP, CSLIP, CPPP, DHCP, IP pooling, async master interfaces, ARAP 1.0/2.0, IPX CP, MacIP, ATCP	SLIP, PPP, CSLIP, CPPP, DHCP, IP pooling, async master interfaces, IPX and ARAP on virtual async interfaces, ARAP 1.0/2.0, IPX CP, MacIP, ATCP

Category	IP Routing	IP/IPX Routing	Desktop	Enterprise
Terminal services[9]	Telnet, rlogin, X.25 PAD	Telnet, rlogin, X.25 PAD	Telnet, rlogin, X.25 PAD	Telnet, rlogin, X.25 PAD, Xremote, LAT[10], TN3270
Product numbers	See Table 225.	See Table 225.	See Table 225.	See Table 225.

1. See the category "IBM Support" for information about source-route bridging (SRB).
2. PPP includes support for LAN protocols supported by the feature set, address negotiation, PAP and CHAP authentication, and PPP compression. Multilink PPP is available with Cisco IOS Release 11.0(4) and later releases.
3. Includes X.25 switching
4. ISDN support includes calling line identification (ANI), X.25 over the B channel, ISDN subaddressing, and applicable WAN optimization features.
5. X.25 payload compression. Frame Relay payload compression is available in Cisco IOS Release 11.0(4) and later releases.
6. "Optional" means a separate Cisco IOS feature set with the IBM base option: IP/IBM base, IP/IPX/IBM base, Desktop/IBM base.
7. QLLC and Bisync are available in IP/IBM base in Cisco IOS Release 11.0(3) and later.
8. QLLC and Bisync are available in IP/IPX/IBM base and Desktop/IBM base in Cisco IOS Release 11.0(2) and later.
9. Limited support on router auxiliary ports.
10. Use of LAT requires terminal license (FS-L8-10.X= for an 8-user license or FS-L16-10.X= for a 16-user license).

Table 222 Cisco IOS Release 10.3 Feature Sets—AccessPro PC Card

Category	IP Routing	IP/IPX Routing	Desktop	Enterprise
LAN support	IP, transparent and translational bridging[1], multiring, LAN extension host	IP, transparent and translational bridging[1], multiring, LAN extension host, Novell IPX	IP, transparent and translational bridging[1], multiring, LAN extension host, Novell IPX, AppleTalk 1 and 2, DECnet IV	IP, transparent and translational bridging[1], multiring, LAN extension host, Novell IPX, AppleTalk 1 and 2, DECnet IV, DECnet V, OSI, XNS, Banyan VINES, Apollo Domain
WAN services	HDLC, PPP[2], X.25[3], Frame Relay, ISDN[4], SMDS, Switched 56	HDLC, PPP[2], X.25[3], Frame Relay, ISDN[4], SMDS, Switched 56, IPXWAN 2.0	HDLC, PPP[2], X.25[3],Frame Relay, ISDN[4], SMDS, Switched 56, IPXWAN 2.0	HDLC, PPP[2], X.25[3], Frame Relay, ISDN[4], SMDS, Switched 56, IPXWAN 2.0
WAN optimization	Header, link, and payload compression[5]; dial-on-demand; dial backup; bandwidth-on-demand; custom and priority queuing; snapshot routing	Header, link, and payload compression[5]; dial-on-demand; dial backup; bandwidth-on-demand; custom and priority queuing; snapshot routing	Header, link, and payload compression[5]; dial-on-demand; dial backup; bandwidth-on-demand; custom and priority queuing; snapshot routing	Header, link, and payload compression[5]; dial-on-demand; dial backup; bandwidth-on-demand; custom and priority queuing; snapshot routing
IP routing	RIP, IGRP, Enhanced IGRP, OSPF, BGP, EGP, PIM, NHRP	RIP, IGRP, Enhanced IGRP, OSPF, BGP, EGP, PIM, NHRP	RIP, IGRP, Enhanced IGRP, OSPF, BGP, EGP, PIM, NHRP	RIP, IGRP, Enhanced IGRP, OSPF, BGP, EGP, PIM, NHRP, ES-IS, IS-IS
Other routing	–	IPX RIP, NLSP	IPX RIP, NLSP[6], RTMP, AURP	IPX RIP, NLSP, RTMP, AURP, SRTP
IBM support	Optional[7]: SRB/RSRB; SRT; DLSw+[8]; SNA and NetBIOS WAN optimization via local acknowledgment, caching, and filtering; SDLC integration, SDLC-to-LAN conversion (SDLLC); SDLC transport (STUN); Frame Relay SNA Support (RFC 1490)	Optional[7]: SRB/RSRB; SRT; DLSw+[8]; SNA and NetBIOS WAN optimization via local acknowledgment, caching, and filtering; SDLC integration; SDLC-to-LAN conversion (SDLLC); SDLC transport (STUN); Frame Relay SNA Support (RFC 1490)	Optional[7]: SRB/RSRB; SRT; DLSw+[8]; SNA and NetBIOS WAN optimization via local acknowledgment, caching, and filtering; SDLC integration; SDLC-to-LAN conversion (SDLLC); SDLC transport (STUN); Frame Relay SNA Support (RFC 1490)	Included: SRB/RSRB; SRT; DLSw+[8]; SNA and NetBIOS WAN optimization via local acknowledgment, caching, and filtering; SDLC integration; SDLC-to-LAN conversion (SDLLC); SDLC transport (STUN); Frame Relay SNA Support (RFC 1490); TG/COS; QLLC; Downstream PU Concentration (DSPU)

Category	IP Routing	IP/IPX Routing	Desktop	Enterprise
Management	AutoInstall, SNMP, Telnet	AutoInstall, SNMP, Telnet	AutoInstall, SNMP, Telnet	AutoInstall, SNMP, Telnet
Security	Access lists, extended access lists, access security, TACACS+	Access lists, extended access lists, access security, TACACS+	Access lists, extended access lists, access security, TACACS+	Access lists, extended access lists, access security, TACACS+
Protocol translation	–	–	–	Telnet, LAT, rlogin, TN3270, X.25, PPP
Remote node[9]	SLIP, PPP, CSLIP, CPPP, DHCP[10]	SLIP, PPP, CSLIP, CPPP, DHCP[10], IPXCP	SLIP, PPP, CSLIP, CPPP, ARAP 1.0/2.0, IPXCP, MacIP, ATCP[10], DHCP[10]	SLIP, PPP, CSLIP, CPPP, ARAP 1.0/2.0, IPXCP, MacIP, ATCP[10], DHCP[10]
Terminal services[9]	Telnet, rlogin, X.25 PAD	Telnet, rlogin, X.25 PAD	Telnet, rlogin, X.25 PAD	Telnet, rlogin, X.25 PAD, Xremote, LAT[11], TN3270
Product numbers	See Table 225.	See Table 225.	See Table 225.	See Table 225.

1. See the category “IBM Support” in this table for information about source-route bridging.
2. PPP includes support for LAN protocols supported by the feature set, PAP and CHAP authentication, and PPP compression.
3. Includes X.25 switching.
4. ISDN support includes calling line identification (ANI), X.25 over the B channel, ISDN subaddressing, and applicable WAN optimization features
5. X.25 payload compression.
6. NLSP is supported with the Desktop option in Cisco IOS Release 10.3(2) and later releases.
7. “Optional” means a separate Cisco IOS feature set with the IBM base option: IP/IBM base, IP/IPX/IBM base, or Desktop/IBM base.
8. DLSw+ is supported in Cisco IOS Release 10.3(2) and later releases.
9. Limited support on router auxiliary ports.
10. ATCP and DHCP proxy client is supported in Cisco IOS Release 10.3(3) and later releases.
11. Use of LAT requires terminal license (FS-L8-10.X= for an 8-user license or FS-L16-10.X= for a 16-user license).

Table 223 Cisco IOS Release 10.2 Feature Sets—AccessPro PC Card

Category	IP Routing	IP/IPX Routing[1]	Desktop	Enterprise
LAN support	IP; transparent, translational, and source-route bridging; LAN extension host; GRE	IP; transparent, translational, and source-route bridging; LAN extension host; GRE; Novell IPX	IP; transparent, translational, and source-route bridging; LAN extension host; GRE; Novell IPX; AppleTalk Phase 1 and 2; DECnet IV	IP; transparent, translational, and source-route bridging; LAN extension host; GRE; Novell IPX; AppleTalk Phase 1 and 2; DECnet IV; DECnet V; XNS; Banyan VINES; OSI; Apollo Domain
WAN services	HDLC, PPP[2], X.25[3], Frame Relay, ISDN[4], SMDS[5], Switched 56	HDLC, PPP[2], X.25[3], Frame Relay, ISDN[4], IPXWAN SMDS[5], Switched 56	HDLC, PPP[2], X.25[3], Frame Relay, ISDN[4], IPXWAN, SMDS[5], Switched 56	HDLC, PPP[2], X.25[3], Frame Relay, ISDN[4], IPXWAN, SMDS[5], Switched 56
WAN optimization	Header, link, and payload compression[6]; dial-on-demand; dial backup; bandwidth-on-demand; custom and priority queuing; snapshot routing	Header, link, and payload compression[6]; dial-on-demand; dial backup; bandwidth-on-demand; custom and priority queuing; snapshot routing	Header, link, and payload compression[6]; dial-on-demand; dial backup; bandwidth-on-demand; custom and priority queuing; snapshot routing	Header, link, and payload compression[6]; dial-on-demand; dial backup; bandwidth-on-demand; custom and priority queuing; snapshot routing
IP routing	RIP, IGRP, Enhanced IGRP, OSPF, BGP, EGP, PIM	RIP, IGRP, Enhanced IGRP, OSPF, BGP, EGP, PIM	RIP, IGRP, Enhanced IGRP, OSPF, BGP, EGP, PIM	RIP, IGRP, Enhanced IGRP, OSPF, BGP, EGP, PIM, ES-IS, IS-IS
Other routing	–	IPX RIP	IPX RIP, RTMP, AURP	IPX RIP, RTMP, AURP, SRTP

Category	IP Routing	IP/IPX Routing[1]	Desktop	Enterprise
IBM support	Optional[7]: RSRB; SNA and NetBIOS WAN optimization via local acknowledgment, caching, and filtering[8]	Optional[7]: RSRB; SNA and NetBIOS WAN optimization via local acknowledgment, caching, and filtering[9]	Optional[7]: RSRB; SNA and NetBIOS WAN optimization via local acknowledgment, caching, and filtering[10]	Included: RSRB; SNA and NetBIOS WAN optimization via local acknowledgment, caching, and filtering; SDLC integration; SDLC-to-LAN conversion (SDLLC); SDLC transport (STUN); TG/COS; QLLC
Management	AutoInstall, SNMP, Telnet	AutoInstall, SNMP, Telnet	AutoInstall, SNMP, Telnet	AutoInstall, SNMP, Telnet
Security	Access lists, extended access lists, access security, TACACS	Access lists, extended access lists, access security, TACACS	Access lists, extended access lists, access security, TACACS	Access lists, extended access lists, access security, TACACS
Protocol translation	–	–	–	Telnet, LAT, rlogin, TN3270, X.25
Remote node[11]	SLIP, PPP, CSLIP, CPPP	SLIP, PPP, CSLIP, CPPP, IPXCP	SLIP, PPP, CSLIP, CPPP, ARAP 1.0/2.0, IPXCP, MacIP	SLIP, PPP, CSLIP, CPPP, ARAP 1.0/2.0, IPXCP, MacIP
Terminal services[11]	Telnet, rlogin, X.25 PAD	Telnet, rlogin, X.25 PAD	Telnet, rlogin, X.25 PAD	Telnet, rlogin, X.25 PAD, Xremote, LAT[12], TN3270
Product numbers	See Table 225.	See Table 225.	See Table 225.	See Table 225.

1. Only available with Cisco IOS Release 10.2(2) and later.
2. PPP includes support for LAN protocols supported by the feature set, address negotiation, and PAP and CHAP authentication.
3. Includes X.25 switching.
4. ISDN support includes calling line identification (ANI), X.25 over the B channel, ISDN subaddressing, and applicable WAN optimization.
5. Prior to Cisco IOS Release 10.2(2), SMDS was only available as part of the Enterprise set.
6. X.25 payload compression.
7. "Optional" means a separate Cisco IOS feature set with the IBM base option: IP/IBM base, IP/IPX/IBM base, or Desktop/IBM base.
8. To obtain the IBM base functionality option with the IP routing feature set, order product number SF25CS-10.2.2 or later.
9. To obtain the IBM base functionality option with the IP/IPX routing feature set, order product number SF25DS-10.2.2 or later.
10. To obtain the IBM base functionality option with the Desktop feature set, order product number SF25BS-10.2.2 or later.
11. Supported on access servers (with limited support on router auxiliary ports).
12. Use of LAT requires terminal license (FS-L8-10.X= for an 8-user license or FS-L16-10.X= for a 16-user license).

Table 224 Cisco IOS Release 10.0 Feature Sets—AccessPro PC Card

Category	IP Routing	Desktop	Enterprise
LAN support	IP; transparent, translational, and source-route bridging; GRE	IP; transparent, translational, and source-route bridging; GRE; Novell IPX; AppleTalk 1 and 2; DECnet IV	IIP; transparent, translational, and source-route bridging; GRE; Novell IPX; AppleTalk 1 and 2; DECnet IV; DECnet V; OSI; XNS; Banyan VINES; Apollo Domain
WAN services	HDLC, PPP[1], X.25[2], Frame Relay, ISDN[3], Switched 56	HDLC, PPP[1], X.25[2], Frame Relay, ISDN[3], IPXWAN, Switched 56	HDLC, PPP[1], X.25[2], Frame Relay, ISDN[3], IPXWAN, SMDS, Switched 56
WAN optimization	Header and link compression, dial-on-demand, dial backup, bandwidth-on-demand, custom and priority queuing	Header and link compression, dial-on-demand, dial backup, bandwidth-on-demand, custom and priority queuing	Header and link compression, dial-on-demand, dial backup, bandwidth-on-demand, custom and priority queuing
IP routing	RIP, IGRP, Enhanced IGRP, OSPF, BGP, EGP	RIP, IGRP, Enhanced IGRP, OSPF, BGP, EGP	RIP, IGRP, Enhanced IGRP, OSPF, BGP, EGP, ES-IS, IS-IS
Other routing	–	IPX RIP, RTMP	IPX RIP, RTMP, SRTP

Category	IP Routing	Desktop	Enterprise
IBM support	RSRB; SNA and NetBIOS optimization via local acknowledgment, caching, and filtering	RSRB; SNA and NetBIOS optimization via local acknowledgment, caching, and filtering	RSRB; SNA and NetBIOS optimization via local acknowledgment, caching, and filtering, SDLLC Integration; SDLC-to-LAN conversion (SDLLC); SDLC transport (STUN); TG/COS
Management	AutoInstall, SNMP, Telnet	AutoInstall, SNMP, Telnet	AutoInstall, SNMP, Telnet
Security	Access lists, extended access lists, access security, TACACS	Access lists, extended access lists, access security, TACACS	Access lists, extended access lists, access security, TACACS
Protocol translation	–	–	Telnet, LAT, rlogin, TN3270, X.25
Remote node[4]	SLIP, CSLIP, PPP, CPPP	SLIP, CSLIP, PPP, CPPP, ARAP 1.0, IPXCP, MacIP	SLIP, CSLIP, PPP, CPPP, ARAP 1.0, IPXCP, MacIP
Terminal services[4]	Telnet, rlogin, X.25 PAD	Telnet, rlogin, X.25 PAD	Telnet, rlogin, X.25 PA, XRemote, LAT[5], TN 3270
Product numbers	See Table 225.	See Table 225.	See Table 225.

1. PPP includes support for LAN protocols supported by the feature set, PAP and CHAP authentication, and PPP compression.
2. Includes X.25 switching.
3. ISDN support includes calling line identification (ANI), X.25 over the B channel, ISDN subaddressing, and applicable WAN optimization features.
4. Limited support on router auxiliary ports.
5. Use of LAT requires terminal license (FS-L8.10.X= for an 8-user license or FS-L16-10.X= for a 16-user license).

Table 225 lists the software feature set product numbers for Cisco IOS Releases 11.1, 11.0, 10.3, and 10.2.

Note All models include a minimum of 4-MB Flash memory; however, depending on the Cisco IOS release feature set that you order with the system, it might require more memory. Refer to Table 228 and Table 229, later in this chapter, for the minimum Flash memory required for each feature set. Refer to Table 232 for ordering information.

Table 225 Cisco IOS Software Product Numbers—AccessPro PC Card

Description	Product Number[1]
IP	SFAPC-xx.x.x SWAPC-xx.x.x=
IP with IBM base	SFAPCS-xx.x.x SWAPCS-xx.x.x=
IP/IPX	SFAPD-xx.x.x SWAPD-xx.x.x=
IP/IPX with IBM base	SFAPDS-xx.x.x SWAPDS-xx.x.x=
Desktop	SFAPB-xx.x.x SWAPB-xx.x.x=

Description	Product Number[1]
Desktop with IBM base	SFAPBS-xx.x.x SWAPBS-xx.x.x=
Enterprise	SFAPA-xx.x.x SWAPA-xx.x.x=

1. Substitute the release number for xx.x.x in the product number (for example, SWAPC-11.1.1=).

Feature sets for Cisco IOS Releases 11.1, 11.0, 10.3, and 10.2 can be upgraded as described in Table 226. To order an upgrade, you must use two product numbers; one represents the upgrade license and the other represents the software. For example, to upgrade from an IP feature set to an IP feature set with IBM base functionality, order product number FRAP-CCS= (the upgrade license) and SWAPCS-xx.x.x= (the software).

For additional details about how to order software updates and upgrades, see the section "Software Ordering Examples" in the chapter "Cisco IOS Software."

Table 226 Cisco IOS Software Upgrades—AccessPro PC Card

Feature Set Upgrade	Product Number[1]
IP to IP with IBM base functionality	FRAP-CCS= and SWAPCS-xx.x.x=
IP to IP/IPX	FRAP-CD= and SWAPD-xx.x.x=
IP to IP/IPX with IBM base functionality	FRAP-CDS= and SWAPDS-xx.x.x=
IP to Desktop	FRAP-CB= and SWAPB-xx.x.x=
IP to Desktop with IBM base functionality	FRAP-CBS= and SWAPBS-xx.x.x=
IP to Enterprise	FRAP-CA= and SWAPA-xx.x.x=
IP with IBM base to IP/IPX with IBM base functionality	FRAP-CSDS= and SWAPDS-xx.x.x=
IP with IBM base to Desktop with IBM base functionality	FRAP-CSBS= and SWAPBS-xx.x.x=
IP with IBM base to Enterprise	FRAP-CSA= and SWAPA-xx.x.x=
IP/IPX to IP/IPX with IBM base functionality	FRAP-DDS= and SWAPDS-xx.x.x=
IP/IPX to Desktop	FRAP-DB= and SWAPB-xx.x.x=
IP/IPX to Desktop with IBM base functionality	FRAP-DBS= and SWAPBS-xx.x.x=
IP/IPX to Enterprise	FRAP-DA= and SWAPA-xx.x.x=
IP/IPX with IBM base to Desktop with IBM base functionality	FRAP-DSBS= and SWAPBS-xx.x.x=
IP/IPX with IBM base to Enterprise	FRAP-DSA= and SWAPA-xx.x.x=
Desktop to Desktop with IBM base functionality	FRAP-BBS= and SWAPBS-xx.x.x=
Desktop to Enterprise	FRAP-BA= and SWAPA-xx.x.x=
Desktop with IBM Base to Enterprise	FRAP-BSA= and SWAPA-xx.x.x=

1. For Cisco IOS Release 11.1, 11.0, 10.3, and 10.2, substitute the release number for xx.x.x in the product number (for example, SWAPD-11.1.1=).

Table 227 lists product numbers used to upgrade Cisco IOS Release 10.0 feature sets.

Table 227 Cisco IOS Release 10.0 Software Upgrades—AccessPro PC Card

Upgrade[1]	Product Number
IP to Desktop[2]	SWAP-10.0.xCB=
IP to Enterprise[3]	SWAP-10.0.xCA=
Desktop to Enterprise[4]	SWAP-10.0.xBA=

1. A minimum of 4-MB Flash memory is required for all feature sets.
2. Requires a minimum of 2-MB DRAM.
3. Requires a minimum of 4-MB DRAM.
4. Requires a minimum of 6-MB DRAM.

Adding a feature set may require you to purchase more memory. Table 228 lists the minimum memory requirements for Cisco IOS Release 11.1 and 11.0 feature sets; Table 229 lists the requirements for Cisco IOS Release 10.3, 10.2, and 10.0 feature sets. The minimum memory requirements listed were chosen for typical branch and remote office applications. If your network is very large or using complex routing protocols, you may need more memory. Configuration analysis and testing are encouraged.

Table 228 AccessPro PC Card Minimum Memory Requirements for Cisco IOS Release 11.1 and 11.0

	Cisco IOS Release 11.1		Cisco IOS Release 11.0	
Cisco 2500 Series Feature Set	Flash Memory	Total DRAM Memory[1]	Flash Memory	Total DRAM Memory[1]
IP	4 MB	2 MB	4 MB	2 MB
IP with IBM base	8 MB	6 MB	8 MB	6 MB
IP/IPX	8 MB	6 MB	4 MB	6 MB
IP/IPX with IBM base	8 MB	6 MB	8 MB	6 MB
Desktop	8 MB	6 MB	8 MB	6 MB
Desktop with IBM base	8 MB	6 MB	8 MB	6 MB
Enterprise	8 MB	6 MB	8 MB	6 MB

1. The total DRAM memory is the total combined primary and shared DRAM memory. See Table 230.

Table 229 Access Pro PC Card Minimum Memory Requirements for Cisco IOS Release 10.3, 10.2, and 10.0

Feature Set	Cisco IOS Release 10.3[1]		Cisco IOS Release 10.2[1]		Cisco IOS Release 10.0[1]	
	Flash Memory	Total DRAM Memory	Flash Memory	Total DRAM Memory	Flash Memory	Total DRAM Memory
IP	4 MB	2 MB	4 MB	2 MB	4 MB	2 MB
IP with IBM base	4 MB	6 MB	4 MB	6 MB	–	–
IP/IPX	4 MB	6 MB	4 MB	6 MB	–	–
IP/IPX with IBM base	8 MB	6 MB	4 MB	6 MB	–	–
Desktop	4 MB	6 MB	4 MB	6 MB	4 MB	6 MB
Desktop with IBM base	8 MB	6 MB	4 MB	6 MB	–	–
Enterprise	8 MB	6 MB	8 MB	6 MB	4 MB	6 MB

1. The total DRAM memory is the total combined primary and shared DRAM memory. See Table 230.

There are two types of DRAM memory on the AccessPro PC cards: primary and shared (packet). Primary memory is used to store the operating configuration, routing tables, caches, queues, and packets. Shared memory is used to store incoming and outgoing packets. In Table 230, the physical configuration column lists the amount of fixed DRAM and DRAM SIMM memory supported. The system usage lists how the system allocates the total DRAM memory installed.

Table 230 Shared and Primary DRAM Memory—AccessPro PC Cards

Total DRAM Memory	Physical Configuration		System Usage	
	Fixed DRAM[1]	DRAM SIMM	Shared DRAM Memory	Primary DRAM Memory
2 MB	2 MB	–	1 MB	1 MB
6 MB	2 MB	4 MB	2 MB	4 MB
10 MB	2 MB	8 MB	2 MB	8 MB
18 MB	2 MB	16 MB	2 MB	16 MB

1. Fixed DRAM is soldered on the system card. AccessPro PC cards always ship with 2 MB of fixed DRAM.

Model AP-EC

The AccessPro AP-EC contains the following ports:

- RJ-45 Ethernet 10BaseT port
- 60-pin serial port for a Cisco serial interface cable
- RJ-45 auxiliary port for DTE/DCE

Figure 100 Model AP-EC AccessPro PC Card

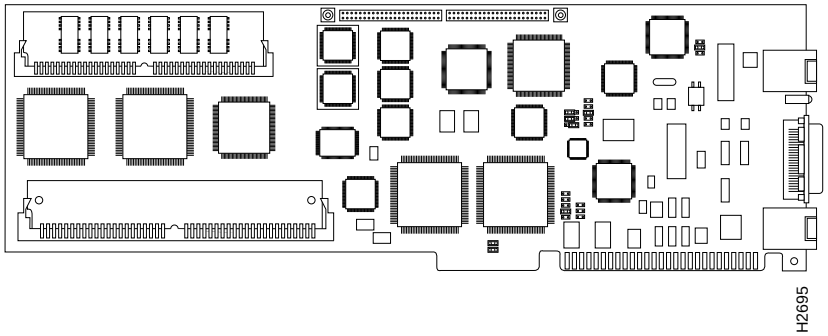
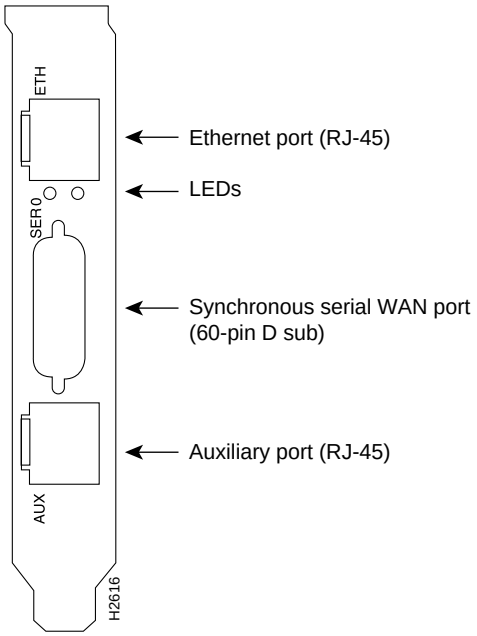


Figure 101 Model AP-EC AccessPro Rear Panel



Model AP-RC

The AccessPro AP-RC contains the following ports:

- RJ-45 Token Ring (4 or 16 Mbps)
- 60-pin serial port for a Cisco serial interface cable
- RJ-45 auxiliary port for DTE/DCE

Figure 102 Model AP-RC AccessPro PC Card

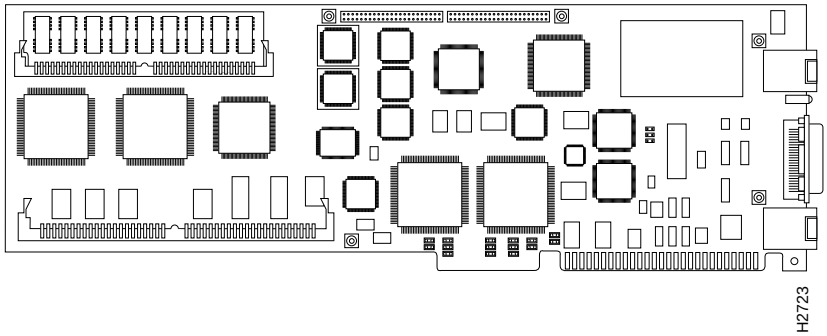
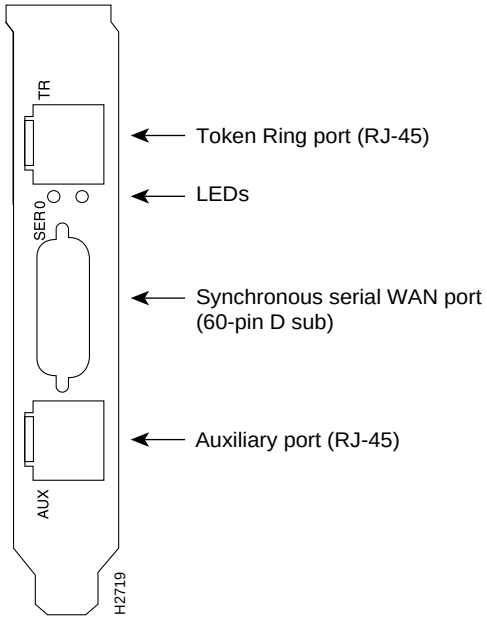


Figure 103 Model AP-RC Rear Panel



Model AP-EBC

The AccessPro AP-EBC contains the following ports:

- RJ-45 Ethernet 10BaseT port
- Two 60-pin serial ports for connection to a Cisco serial interface cable
- RJ-45 auxiliary port for DTE/DCE
- RJ-45 BRI port

Note that Model AP-EBC comprises a Model AP-EC AccessPro card with a daughter card mounted on the noncomponent side, as shown in Figure 104.

Figure 104 AccessPro Card and Daughter Card

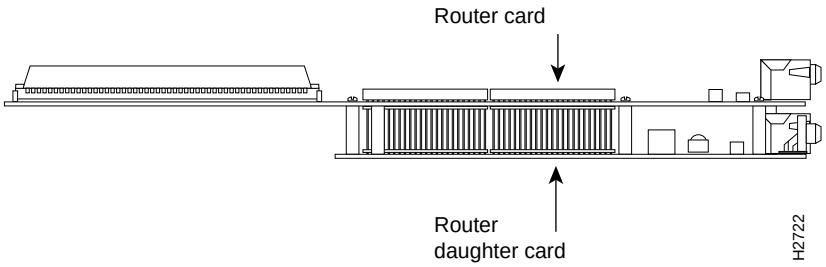
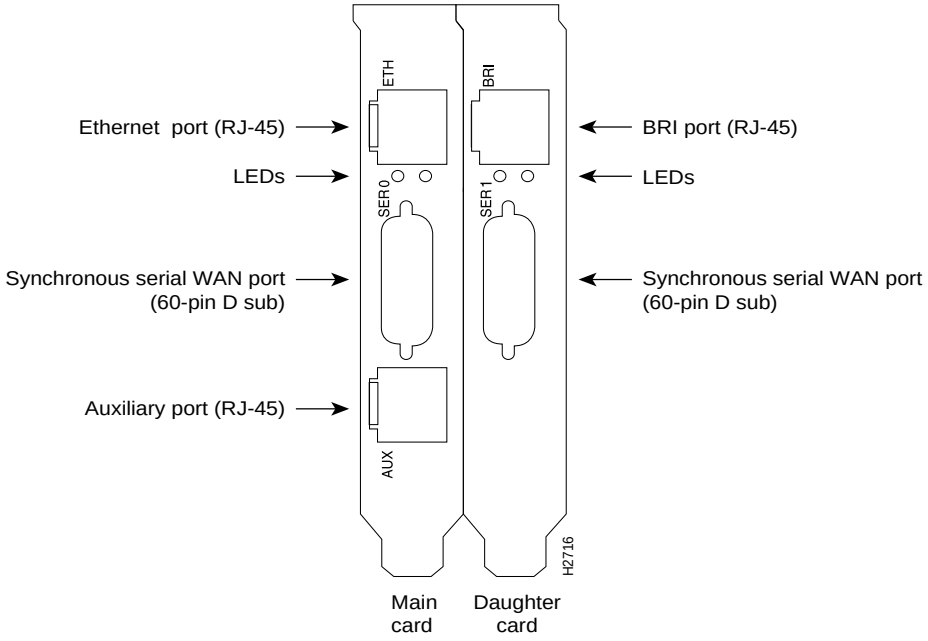


Figure 105 Model AP-EBC Rear Panel



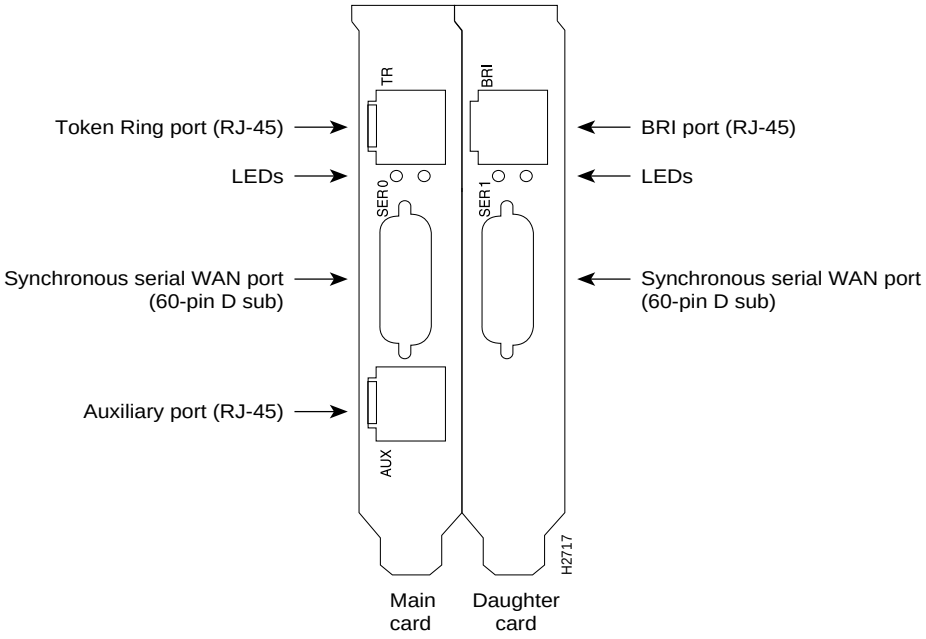
Model AP-RBC

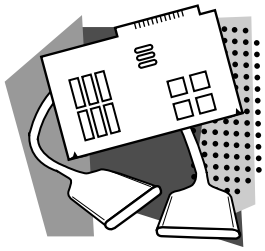
The AccessPro AP-RBC contains the following ports:

- RJ-45 Token Ring (4 or 16 Mbps)
- Two 60-pin serial ports for connection to a Cisco serial interface cable
- RJ-45 auxiliary port for DTE/DCE
- RJ-45 BRI port

Note that Model AP-RBC comprises a Model AP-RC AccessPro card with a daughter card mounted on the noncomponent side, as shown in Figure 104.

Figure 106 Model AP-RBC Rear Panel





Options

The options for the AccessPro PC card include cables, memory, and software upgrades. For cable illustrations, refer to the section “Specifications” in the chapter “Cables and Transceivers” later in this catalog. Table 231 lists the cable options, and Table 232 lists the memory options.

Table 231 AccessPro PC Card Cable Options

Cables	Product Number
EIA/TIA-232 male DTE interface, 10' (3 m)	CAB-232MT
EIA/TIA-232 female DCE interface, 10' (3 m)	CAB-232FC
EIA/TIA-449 male DTE interface, 10' (3 m)	CAB-449MT
EIA/TIA-449 female DCE interface, 10' (3 m)	CAB-449FC
EIA-530 male DTE interface, 10' (3 m)	CAB-530MT
V.35 male DTE interface, 10' (3 m)	CAB-V35MT
V.35 female DCE interface, 10' (3 m)	CAB-V35FC
X.21 male DTE interface, 10' (3 m)	CAB-X21MT
X.21 female DCE interface, 10' (3 m)	CAB-X21FC
Auxiliary/console port cable kit	ACS-2500ASYN

Table 232 AccessPro PC Card Memory Options

Description	Product Number
4-MB DRAM	MEM-1X4D
4-MB DRAM (spare)	MEM-1X4D=
8-MB DRAM	MEM-1X8D
8-MB DRAM (spare)	MEM-1X8D=
16-MB DRAM	MEM-1X16D
16-MB DRAM (spare)	MEM-1X16D=
4-MB Flash SIMM (spare)	MEM-1X4F=
4- to 8-MB Flash memory upgrade	MEM-1X8F-DFB-U[1, 2]
8-MB dual Flash bank SIMM (spare)	MEM-1X8F-DFB=[2]
16-MB dual Flash bank SIMM	MEM-1X16F-DFB
16-MB dual Flash bank SIMM (spare)	MEM-1X16F-DFB=[3]

1. Applies to Cisco IOS Release 11.x feature sets that require more than 4-MB Flash memory.
2. Dual-bank Flash memory is required because AccessPro PC cards contain only one slot for Flash memory. It can operate as either two banks of 4 MB for dual-Flash bank operation or as 8 MB contiguous.
3. Dual-bank Flash memory is required because AccessPro PC cards contain only one slot for Flash memory. It can operate as either two banks of 8 MB for dual-Flash bank operation or as 16 MB contiguous.